REMARKS

Claims 1-18 are all the claims pending in the application. By this Amendment, Applicant amends claims 1, 7, and 15. Claims 1 and 7 are amended for better conformity with the US patent practice. Claim 15 is amended to further clarify the invention. In addition, Applicant amends the specification to cure a minor informality noted by the Examiner *i.e.*, to formally define an abbreviation. No new matter is being added.

I. Summary of the Office Action

After four Office Actions on the merits, the Examiner now rejects claims 1-18 under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement, 35 U.S.C. § 112, second paragraph as being indefinite, and 35 U.S.C. § 101 as being directed to a non-statutory invention. In short, after four Office Actions on the merits, the Examiner now contends that the claims (including the original features) are too indefinite and not adequately described to be examined on the merits.

II. Claim Rejections under 35 U.S.C. § 112, first paragraph

Claims 1-18 are rejected under 35 U.S.C. § 112, first paragraph. Applicant respectfully traverses this rejection in view of the following comments.

The Examiner has provided a number of features in the specification thought to be unclear grouping them under elements: a-s. Applicant addresses these features below by logically grouping them in their respective categories.

A. Legal Standard

There is a strong presumption that an adequate written description of the claimed invention is present when the application is filed. *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976) ("we are of the opinion that the PTO has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims"). MPEP § 2163.

B. Communication Means and Receiving Means are Adequately Described in the Specification

The Examiner alleges that ***(a)*** the specification fails to provide a description of the "communication means" and "receiving means" (*see* pages 2-3 of the Office Action), ***(i)*** the specification fails to provide description of various types of communication means, ***(k)*** the specification fails to provide description of specific types of other communication means, ***(m)*** the specification fails to describe communication means of different kind, ***(n)*** the specification fails to describe the functionality of blackboard type communication means, ***(o)*** the specification fails to describe "***why***" types of channels are used in this invention (*see* page 5 of the Office Action).

Applicant respectfully submits that page 1 (line 16) to page 2 (line 4) of the specification adequately describes various types of the communication means. Specifically, it is disclosed that the communication means are communication channels of various kinds for communication between the software agents in the distributed software architecture (*see* page 1, lines 14 to 18 of the specification).

The Examiner further inquires "why" are these channels used (*see* element "o" on page 5 of the Office Action). Software agents are distributed software *i.e.*, the software agents are not

all located in the same program, in fact, some of them are often located in different hardware machines. Accordingly, if there is some interaction between these software agents, they need to have a way to communicate with each other. For example: if a function A is one software agent that uses the results of a function B, another software agent, then the function B needs to communicate its results to the function A. However, in a distributed computing, where the functions are independent (not all located in the same program), some way of communicating with each other is needed. That is, the functions need a channel to communicate with each especially when they often reside in different hardware machines. As such, function B needs a communication channel with function A to convey its results to function A. However, if the communication channel breaks down, then another communication channel (other communication means) is needed. The specification describes dynamically changing communication channels by providing various different communication modules (*i.e.*, modules that provide access to different communication channels), as discussed in greater detail below.

The specification provides various examples of the communication channels such as point-to-point communication (page 1, lines 21 to 24), broadcast communication (page 1, lines 24 to 26), asynchronous communication (page 1, lines 27 to 32), and blackboard communication (page 1, lines 33 to 36). It is respectfully submitted that one of ordinary skill in the art in light of the specification would readily understand these various types of channels. Furthermore, blackboard communication (*see* element *n* on page 5 of the Office Action) is described in the specification *see* page 1, lines 33 to 36 of the specification.

Receiving means are addressed on page 4, lines 28 to 30 of the specification. It is respectively submitted that one of ordinary skill in the art in light of the specification would readily recognize that the receiving means is software code that receives packets from the communication server.

The Examiner further alleges that it is unclear where these means reside and how they are implemented (*see* pages 2-3 of the Office Action). Applicant respectfully submits that the specification is written for a person of ordinary skill in the art. Accordingly, specification need not provide every little detail and a lengthy background description such as protocols of CORBA, DCOM or other distributed architecture. If this was required, each software application specification would be hundreds and hundreds of pages long. It is respectfully submitted that one of ordinary skill in the art would readily understand the invention in light of the specification and skill in the art. Further, it is Applicant's position that one of ordinary skill in the art would readily know how to implement the receiving means and the communication means in light of the specification and the level of skill in the art.

The disclosure of the specification has been described above.

With respect to level of skill in the art, in the field of distributed computing, CORBA and DCOM are well known. CORBA is also mentioned on page 1 (lines 28 to 33) of the specification. For the Examiner's convenience, it is suggested that the Examiner review the following sites to obtain a better understanding of distributed computing http://www.omg.org/gettingstarted/corbafaq.htm#TotallyNew and http://en.wikipedia.org/wiki/Distributed_component_object_model.

It is respectfully submitted that in light of specification and level of skill in the art, one of ordinary skill in the art would readily recognize how to implement the communication means and the receiving means.

C. Communication Modules are Adequately Described in the Specification

The Examiner further contends that it is unclear ***(b)*** what procedures would be taken by the communication module to provide access to a different communication means (*see* page 3 of the Office Action), ***(g)*** how does API relate to software agents, ***(h)*** how do programming interfaces relate to software agents (*see* page 4 of the Office Action), and ***(j)*** the specification fails to describe the replacement of communication modules (*see* page 5 of the Office Action). Applicant respectfully submits that the Examiner has misquoted claim 7 in element b on page 3 of the Office Action and misinterpreted the exemplary embodiments described in the specification.

Specifically, claim 7 recites: "communication modules" (emphasis added) and not a communication module. Applicant respectfully submits that all communication modules comprise a common interface (API)[1] for communication with the software agent and a specific programming interface that translates code from the software agent to a specific communication means (communication channel) established between the two software agents (*see* page 4, lines 10 to 28 of the specification). The same communication module would not provide access to different communication means. In other words, the common interface would be the same in all

[1] http://foldoc.org/foldoc/foldoc.cgi?API

communication modules but the specific programming interface would vary depending on the communication channel to which it provides access. For example, a communication module for a notification channel would have a different programming interface from the communication module for a blackboard channel and so on.

By way of an analogy and to further Examiner's understanding, the software agents speak English but the communication channels speak various other languages such as German (notification channel), French (blackboard channel type), Italian, Chinese, Japanese, and so on. Accordingly, the communication module will speak English to the software agents and translate from English into one of the other languages depending on the language of the communication channel. For example, for the notification channel, the communication module will understand English and German, and translate between these two languages.

To change communication means/channels between software agents, a new communication module (a new translator) needs to be provided. That is, a different translator (specific interface) is needed to translate between the software agent and the new communication means (*e.g.*, for the blackboard channel type, a translator between English and French is needed). Accordingly, the software agents have receiving means for obtaining new communication modules. When the new communication modules are received, the software agent uses these new communication modules and as such communicate via different communication means (page 4, line 28 to page 5, line 3). In short, one of ordinary skill in the art in light of the specification would readily recognize what procedure is taken to access different communication means.

D. The Software Agents are Adequately Described in the Specification

The Examiner further contends that ***(c)*** "a piece of object code of a distributed computing" is unclear since the specification only states "the communication modules are preferably encoded in a language such as Java that enables their object code to be caused to migrate through a distributed computer system" (*see* page 3 of the Office Action) and ***(e)*** the specification describe the location of these agents (*see* page 4 of the Office Action). The relevance of the Examiner's citation with respect to item (c) is not understood. A piece of object code is directed to a software agent, the portion of the specification quoted by the Examiner is directed to the communication modules. In other words, the two are unrelated.

Further, Applicant respectfully submits that page 1, lines 9 to 17 of the specification recites:

> The term "agent" or "software agent" is used to designate <u>any piece of object code that is to some extent autonomous and independent</u>. Because of this independence, communication between a plurality of agents can give rise to problems.
>
> In present-day <u>distributed software architectures</u>, software agents communicate with one another over preestablished communication means. These channels can be of various kinds (emphasis added).

Furthermore, page 3, lines 33 to 37 of the specification recites:

> In FIG. 1, two software agents C_1 and C_2 communicate via communication means M. By way of example, these software agents can be agents proper, i.e. independent software entities, having their own execution resource or "threads" available to them.

Applicant respectfully submits that the above-quoted portions of the specification provide adequate support for the software agent set forth in the independent claims. Further, Applicant

respectfully submits that one of ordinary skill in the art in light of the specification and skill in the art[2] would readily understand what is a software agent within the meaning of claims 1 and 7.

E. The Specification provides adequate description of communication between the Server and Software Agents, and content of the Communication Modules

The Examiner further contends that ***(d)*** it is unclear whether the software agents are connected via a network or a communication bus and ***(f)*** whether the communication modules are network interface cards (*see* page 4 of the Office Action). Applicant respectfully submits that the software agents communicate with a server via a network in a distributed computing environment (page 4, lines 31 to 34 and page 5, lines 16 to 23 of the specification). Further, clearly, the communication modules are software as they are transmitted from the server to the software agents (page 4, lines 10 to 28). It is respectfully noted that one of ordinary skill in the art would readily appreciate that a network card or a modem cannot be transmitted via a network or a bus from a server. A network card or a modem may be mailed or shipped but cannot be transmitted in binary code over a network or a field bus. One of ordinary skill in the art in light of the specification and skill in the art would readily appreciate that the software agent communicates via a network with the communication server and the communication module is a

[2] For example, CORBA applications are composed of *objects*, individual units of running software that combine functionality and data, and that frequently (but not always) represent something in the real world. Typically, there are many *instances* of an object of a single *type* - for example, an e-commerce website would have many shopping cart object instances, all identical in functionality but differing in that each is assigned to a different customer, and contains data representing the merchandise that its particular customer has selected. For other types, there may be only one instance. When a legacy application, such as an accounting system, is wrapped in code with CORBA interfaces and opened up to clients on the network, there is usually only one instance. http://www.omg.org/gettingstarted/corbafaq.htm#TotallyNew

software module that provides software for such communication. Accordingly, the specification adequately describes the communication between the server and the software agents and the content of the communication module.

F. The Specification provides adequate description of interruptions and alerts

The Examiner further contends that ***(l)*** "under the circumstance" is not adequately described (*see* page 5 of the Office Action). It is respectfully noted that "under the circumstance" is not recited in the claims. Accordingly, it is respectfully submitted that even assuming *arguendo* that the specification fails to provide adequate disclosure of circumstances, it fails to relate to the claimed invention and no relation to the claimed invention has been shown. In short, the claimed invention is adequately supported by the specification.

The Examiner further contends that ***(p)*** the specification does not provide detailed description of the interruptions (page 6 of the Office Action). Applicant respectfully disagrees. Applicant respectfully submits that the specification describes interruptions as an accident on the channel or extreme saturation of the channel (page 5, lines 5 to 13 of the specification and page 6, line 29 to page 7 line 4 of the specification). Further, it is respectfully noted that the claimed invention does not recite "interruptions". Accordingly, "*where*" the interruptions are coming from is unrelated to the claimed invention.

Further, the Examiner contends that ***(q)*** it is unclear what "alr" stands for (*see* page 6 of the Office Action). Applicant respectfully submits that "alr" stands for alarm. In order to clarify this abbreviation, Applicant amends the specification. No new matter is being added. Further, it

is respectfully noted that the claimed invention does not recite "alr". Accordingly, "alr" is unrelated to the claimed invention.

The Examiner further contends that ***(r)*** it is unclear what "these two messages" on page 6, line 12 of the specification refer to (*see* page 6 of the Office Action). The specification of the above-identified application in the preceding sentence recites: "[o]n becoming aware of the interruption, the software agents send messages alr to the communication server S informing it of the breakdown of the communication means between the two software agents C_1 and C_2." If each of the two software agents sends a message alr, then two messages are sent. Accordingly, in response to these two messages, the communication server sends two communication modules to the two software agents. It is respectfully noted that it is clear from the specification what "these two message" refer to. Further, it is respectfully noted that the claimed invention does not recite "these two messages." Accordingly, "these two messages" are unrelated to the claimed invention.

The Examiner also contends that ***(s)*** the specification fails to provide detailed description of the warning and how the warning is interpreted (*see* page 6 of the Office Action). The Examiner is respectfully directed to page 6, lines 4 to 14 of the specification, where a description of the software agents notifying the communication server is provided. Furthermore, it is respectfully noted that the claimed invention does not recite a warning message. Accordingly, the warning is unrelated to the claimed invention.

In view of the foregoing remarks, Applicant respectfully requests the Examiner to withdraw this rejection of claims 1-18.

III. Claim Rejections under 35 U.S.C. § 112, second paragraph

Claims 1-18 are rejected under 35 U.S.C. § 112, second paragraph. Applicant respectfully traverses this rejection in view of the following comments.

This rejection appears to be interrelated to 35 U.S.C. § 112, first paragraph rejection. That is, the Examiner contends that since there is inadequate written description for the unique features of the independent claims 1 and 7, claims 1-18 are indefinite (*see* pages 6-7 of the Office Action). In view of the discussion above with respect to the rejection under 35 U.S.C. § 112, first paragraph, Applicant respectfully submits that the features set forth in claims 1 and 7 are adequately described in the specification and are definite. Accordingly, it is appropriate and necessary for the Examiner to withdraw this rejection of claims 1-18.

IV. Claim Rejections under 35 U.S.C. § 101

Claims 1-18 are rejected under 35 U.S.C. § 101 because the claimed invention is allegedly directed to a non-statutory subject matter. Applicant respectfully requests the Examiner to withdraw this rejection of claims 1-18 in view of the self-explanatory amendments being made herein.

V. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. **IF ANY POINTS REMAIN IN ISSUE, THE EXAMINER IS RESPECTFULLY REQUESTED TO CONTACT THE UNDERSIGNED ATTORNEY AT THE TELEPHONE NUMBER LISTED BELOW**.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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